RAJYA SABHA

Thursday, the 31st July, 1980/the 9th Sravana, 1902 (Saka)

The House met at eleven of the clock, **Mr. Chairman** in the Chair.

ORAL ANSWERS TO QUESTIONS

Import of solar energy technology

*121. DR. (SHRIMATI) NAJMA HEPTULLA:†

DR. RAFIQ ZAKARIA:

Will the PRIME MINISTER be pleased to state:

(a) whether Government have explored the possibility of importing technology for utilisation of solar energy;

(b) whether assistance of the UN specialised agency in this field has been sought; and

(c) if so, what are the details in this regard?

THE DEPUTY MINISTER IN THE DEPARTMENT OF SCIENCE AND TECHNOLOGY AND SPACE (SHRI VIJAY N. PATIL): (a) The basic policy is one of self-reliance within which Government is constantly reviewing the need for import of technology wherever necessary and appropriate and for using inputs from abroad for accelerating indigenous efforts towards utilisation of solar energy.

(b) No assistance has so far been sought from any UN specialised agency for import of technology for utilisation of solar energy.

(c) Does not arise.

†The question was actually asked on the floor of the House by Dr. (Shrimati) Najma Heptulla.

DR. (SHRIMATI) NAJMA HEPTULLA: Sir, the one kw. solar water pump for rural application which is being developed under the Indo FDR Technical Co-operation Programme, has it been put to test? If so, what are the results? What is its water pumping capacity per hour and from what depth? And what is the cost of each pump?

श्री शिव चन्द्र झा: हिन्दी में जवाब दो।

SHRI VIJAY N. PATIL: Sir, with the Federal Republic of Germany we are not having collaboration regarding this water pump ..... फेडरल रिपब्लिक आफ जर्मनी के साथ .....

एक माननीय सदस्य : अंग्रेजी में।

श्री शिव चन्द्र झा : सभापति महोदय, इन को हिन्दी में बोलने के लिए कहिए। हमारे साथ रहे हैं, हिन्दी में बोलना होगा।

SHRI JAHARLAL BANERJEE: If the question is in English, it should be answered in English.

(Interruptions)

SHRI VIJAY N. PATIL: I would like to know from the hon. Member whether she wants the answer in Hindi or English.

DR. (SHRIMATI) NAJMA HEPTULLA: English.

SHRI VIJAY N. PATIL: Mr. Chairman, Sir, the Member has asked about collaboration with the Federal Republic of Germany. As far as water pump is concerned, we do not have collaboration with them; we are having our indigenous pump developed. And regarding the depth of water from which it can be pumped, it is under test. At present, the results of up to 15 feet are obtained, and one dryer pump is taken for demonstration at the Central Electronics Limited Shahibabad in Ghaziabad. Other pumps are also being demonstrated in various parts of the country and the cost of the water pump which is re-

quired for irrigation and other purposes—the economic factor—is being considered.

DR. (SHRIMATI) NAJMA HEPTULLA: There is a Times of India report dated 29th July that 1 kw. solar water pump for rural application is being developed under the Indo-FDR Technical Cooperation Programme. This is the report in the newspaper. Is it a fact that a private company has developed and experimented upon the solar pumps in Orissa? If so, what are their results? Can they be produced economically for commercial use as the USSR has done?

SHRI VIJAY N. PATIL: Sir, regarding the private company in Orissa, I have no knowledge. But regarding the solar pumps being developed in the various institutions—the ITI, the CEL and others—the cost factor comes around Rs. 30,000 for the present panel. And that is because of silicon crystals which are very costly and we are working on reducing the per-watt cost of production of silicon crystals which can generate energy of one watt and which now comes to about Rs. 80 to Rs. 120 per watt of energy generated from silicon crystals.

DR. RAFIQ ZAKARIA: Sir, more than a year ago, a committee appointed by the Government had recommended that the potential of solar radiation be assessed as an alternative source of energy. May I know from the Minister what action the Government has taken in this regard? Further, Sir, I would like to know from him whether this alternate source is technologically feasible and commercially viable. Has the Government made any study from both these points, and if so, what are the conclusions? Further, more, Sir...

MR. CHAIRMAN: How many 'furthers' are there?

DR. RAFIQ ZAKARIA: This is a part of the same question.

MR. CHAIRMAN: Dr. Zakaria, it would be unfair to the Minister and also to the other Members...

DR. RAFIQ ZAKARIA: Furthermore, Sir, it is said that photo-electric devices, such as the solar cells....

(*Interruptions*)

MR. CHAIRMAN: Let the Minister answer your first question.

DR. RAFIQ ZAKARIA: Sir, it is a part of the same question. Furthermore, it is said that photo-electric devices, such as solar cells, can produce electricity directly. It is connected with the same question of alternate source of energy. And photochemical and photo-biological reactions can produce fuel and food. As these are our urgent national requirements, may I know from the Minister whether we have made any progress in harnessing these sources, especially in view of the fact that India is considered as one of the most favourable zones for receiving solar radiation, and whether in this connection, Government proposes....

(*Interruptions*)

SHRI LADLI MOHAN NIGAM: He is reading out the question and.... (*Interruptions*) It is not an oral question that he is asking....

MR. CHAIRMAN: You will have a sample from the other side also of the same type.

DR. RAFIQ ZAKARIA: And whether in this connection, Government proposes to seek any assistance from any foreign country, if not, why not?

SHRI VIJAY N. PATIL: Mr. Chairman, Sir, regarding the mention of the hon. Member that solar energy will constitute alternate source of energy, it is true to the extent of its use centralised at particular locations, and domestic use in villages particularly. At present, it falls in three different categories; one is photo-thermal energy; another is photo-voltaic energy, and what the hon. Member has mentioned about photo—biological energy, that is the energy from the bio-mass. So these are the three categories. Research on these three categories is in progress and application of this to actual use in certain areas is being practised today also. For example, in the case of photo-thermal device, we

are having demonstration-cum-practical use plant at Hardwar, that is, BHEL, where water heating is being done by photo-thermal method. Then there is Qutab Hotel where we are having water heating by this method. Some months ago, Leprosy Centre at Poona also started water heating by solar thermal device. Then we are trying for a 10-tonne drier per day capacity at Ludhiana. Then about cold storage, the technical institutes, the ITIs at Bombay, Madras and Delhi, are trying, and specially regarding air-conditioning and refrigeration, we are having now collaboration with Australia. In regard to photo voltaic cells, I have already mentioned that the Central Electronics Limited, BEL and so many other institutions are working on photo voltaic cells, which is conversion of solar energy into electric energy. The main factor is the cost per peak watt. If we are successful in reducing the cost per peak watt, we will be successful in putting solar energy into commercial use. We hope, we will be able to do it within two years. As far as the panels for running radio, television and other things are concerned, the cost factors are there. At present, this is about Rs. 120 per panel for medium size transister. This can be reduced to Rs. 80 or to Rs. 60 within a span of two years and production on a commercial scale can be started. This is one thing. Solar energy voltaic cells can be used right from one milli watt to many mega-watts. Then, electronic watches can be run on photo valtaic cells. This is another use of this energy. The third use is bio-mass that is photo-biological use. We are developing this at several places and research is under way to have bio-gas from gow dung, bio-gas from human excreta and bio-gas from muinicipal wastes. Therefore, in some cases, we are putting this into practical use and the Khadi and Village Industries Commission, at Bombay and Ahmedabad, have established hundreds of bio-gas plants in villages where the farmers are making actual use of it and instead of burning wood, they are cooking food on bio-gas. These are the three sides of solar energy which are being studied for practical use in the near future.

SHRIMATI SUSHILA SHANKAR ADIVAREKAR: Sir, I would like to know from the hon Minister whether the U.N. Economic and Social Commission for Asia and Pacific has convened a conference in Bangkok in the coming winter for deliberations on mutually convenient exchange of solar technology. If so, I would like to know whether our country is participating in it and I would also like to know whether it is not a fact that some multi-nationals, through their representatives, are trying to influence us and they are trying to retain the Western dominance on the solar energy technology which has been developed by the R and D in our country.

SHRI VIJAY N. PATIL: With regard to the first question, 'Yes'; we are participation in this Conference, With regard to the second part of the question, of course, there is dominance by Western countries. But as all of you know, India is fortunate in having the maximum exposure to sunshine. Other countries which have gone far ahead of India, do not have this much of sunshine. But they are developing this technology or conducting research on solar technology, just to market it to other countries. They are trying to dominate. With regard to the outcome of the U.N. Conference, this remains to be seen. But we are trying to develop our indigenous technology with maximum efforts and we are spending more amount of money on this side of research. Secondly, our conditions are peculiar as compared to the conditions in the Western countries as far as this aspect is concerned, as far as solar energy is concerned, where the exposure to sunshine is the maximum in our case. We do not have to recharge or store the solar energy as the Americans are trying to do. Our conditions are peculiar. We have to conduct research for our own use and wherever neces-

sary, in consonance with the industrial policy of our country, we will be taking knowhow from other countries.

SHRI MANUBHAI PATEL: On a similar question, during the last Session, the hon. Prime Minister has said that the Government will help in a very big way to develop this solar energy, especially in regard to domestic instruments. At that time, Sir, I had said that the Government should give priority, apart from scientific instruments, to solar heater, solar cooker, solar pump and solar battery.

At that time the hon. Prime Minister had said, when I referred that it was good that the solar heater was utilised by the former Prime Minister..

SHRIMATI INDIRA GANDHI: It is the opposite. What I had said was that I was using solar energy but the previous Prime Minister was not. This is what I was told.

MR. CHAIRMAN: I can bear witness to it beause I stayed for a few days there it was not being used.

SHRI MANUBHAI PATEL: I was referring to the same thing to put the records straight. I had said that the former Prime Miniser, namely, Shri Morarji Desai, was using it, etc. and the same should be continued. Then the hon. Prime Minister said: she was using it and the former Prime Minister is not using it, he had discontinued using it. But from the reports etc. I have gathered that he had intended utilising it and he was in favour of its development. Now my question is this. When the Government has not invited any U.N. help, will the Government give topmost priority to domestic appliances in view of the present energy crisis, especially non-availability of cooking gas? Will the Government develop solar cookers and put them into the market on a commercial basis? Regarding bio-gas which is known as gobar gas...

MR. CHAIRMAN: I think the hon. Minister did mention all these things.

SHRI MANUBHAI PATEL: Sir, through the bio-gas programme, when it has come in a very big way in India, we have up till now been able to construct only 80,000 gobar gas plants in villages while during the same period in China they constructed 70 lakh plants. Now scientists all over the world have approved of our plant Indian plant is the best for villages. If that is so, can we not take this programme in a big way? In view of this, I would like to know whether there is any time-bound programme to develop or enlarge this programme of bio-gas plants in villages. This is my first point.

Then, Sir, there are solar cookers and so many other appliances. I am not quoting them.

MR. CHAIRMAN: How does the question of bio-gas arise out of it?

SHRI MANUBHAI PATEL: Solar cooker and solar heater; these are two very important things. Solar battery is also very important. will the Government come out in a very big way and have a time-bound programme to supply them in the market on a commercial basis?

SHRI VIJAY N. PATIL: As for as solar cookers are concerned, they come under solar thermal devices. We have to make it economical for domestic use and for that efficiency and cost effectiveness for different specific applications are being studied and they include selective coatings and paints and development of corrosion resistant device. When we will be able to develop these devices on a commercial scale, at a low cost, they will be put into the market.

About batteries, it depends upon the production of silicon crystal and for the R&D programme is there. We want to develop a low-cost silicon crystal . . .

MR. CHAIRMAN: You have said at Rs. 120, Rs. 85 and all that.

SHRI VIJAY N. PATIL: About gobar gas and bio-gas plants, the

Chinese and Indian conditions are different. In India a farmer must have about 10-15 cattle heads for having a small, family-size gobar gas plant for cooking purposes. Other farmers cannot have that.

MR. CHAIRMAN: Mr. Minister . . .

SHRI VIJAY N. PATIL: We are trying to have community-size gobar gas plants in villages.

MR. CHAIRMAN: Mr. Minister, please keep the gobar gas plant out because it does not arise out of this question.

SHRI MANUBHAI PATEL: Sir, he did reply that gobar gas and biogas plants are being developed. It is a part of this question because it is part of solar energy. It does arise out of this question.

MR. CHAIRMAN: I know, the research people are probably connecting gobar gas with electricity and all that. Now Dr. Bhai Mahavir.

DR. BHAI MAHAVIR: Sir, the hon. Minister...

SHRI N. P. CHENGALRAYA NAIDU: But you said that after him, you will call me.

MR. CHAIRMAN: All right, you go ahead. Dr. Bhai Mahavir, you please sit down; otherwise the soalr energy will fail.

SHRI N. P. CHENGALRAYA NAIDU: Sir, with the increase in electricity charges and the price of diesel oil, it has become very difficult for the agriculturists to put up water pumps. Now solar energy has come. I was told it costs about Rs. 25,000—the solar pump which they have developed now—and there will not be any recurring expenditure on that. It is very difficult for a poor agriculturist to invest Rs. 25,000. If the Government can send our technicians to other countries—namely the Philippines, Australia and New Zeeland—which have developed very well in this field to find out how they are producing and developing bigger water pumps of bigger capacities, then it will be very easy. Even the cost is more. The Government must come forward and ask the banks to give loans at subsidised interests so that they can purchase solar energy water pumps and use them. Is there any proposal by the Government for this?

SHRI VIJAY N. PATIL: The hon. Member has made a good suggestion. We will take note of it.

DR. BHAI MAHAVIR: The hon. Minister has mentioned that R&D has been set to make silicon crystals. Is he aware that years back silicon was accepted as a project under the advice of the Bhabha Committee for research purposes? In 1956, project-based research had been dicided upon in the Science Policy Resolution. After that silicon was selected as a project and this project was taken up by four reputed laboratories in our country—the Solid State Physics Laboratory here, the NPL here and two other laboratories. I do not want to waste time on naming these. In spite of it having been taken up by these four laboratories—and all of them claiming that they had succeeded in developing a process of manufacturing silicon—actually none of them had successfully done it and even today we are importing every ounce of silicon that we are using in this country. My question is will the hon. Minister make a review of whether this project-based research in our country is yielding the results which it should in proportion to the expenses that are being incurred in the country? And if not, I would like to know whether he will go into the question whether the research being given to institutions is caught up in the red tape and bureaucratic stranglehelds and that there should be another way of doing research, namely giving individuals the projects for which loans may be given. Even if grants are not given, interest-free loan may be given and they may be asked to complete those projects on the condition that an equal amount

would be available through commercial exploitation of the research which they do. On this question I would like to remind the hon. Prime Minister that one scienist who has done worthwhile work in solar energy in this country and who has got a national Award—the Hari Om Prairat National Award—is on he road today because he hau made certain complaints of corruption in the laboratory in which he was working. The Prime Minister was good enough to reply to me on that, but she did not refer to the pointed complaints, or whether he had been asked to substantiate those complaints.

MR. CHAIRMAN: That becomes a personal matter.

DR. BHAI MAHAVIR: Not a personal matter. My question is, the individuals who have done worthwhile work are on the road and they are not being encouraged, and the laboratories which were given the chance have failed to yield results.

SHRI PILOO MODY: Does it bother you Sir?

MR. CHAIRMAN: Yes, it does bother me.

DR. BHAI MAHAVIR: I would like to know whether they would like to undertake a review of the implementation of this policy to see whether the R&D is being actually stifled and the talent of the country is being wasted. NPL developed a solar heater. Today, if you go to Israel, they are using solar heaters and they tell their people that it was developed by an Indian scientists But today, Sir, we do not know...

DR. RAFIQ ZAKARIA: Sir, how are you allowing all this? (*Interruptions*). You are allowing a long commentary.

(*Interruptions*)

MR. CHAIRMAN: I allowed every word of yours.

SHRI N. K. P. SALVE: Sir, is it a Question Hour?

(*Interruptions*)

MR. CHAIRMAN: Mr. Salve, please sit down. I am standing.

SHRI N. K. P. SALVE: It is all right for you to say....

(*Interruptions*)

SOME HON. MEMBERS: Sit down.

MR. CHAIRMAN: Please sit down. (*Interruptions*) I did allow every word of Dr. Zakaria to go in, and Dr. Zakaria certainly has no room for complaint. Yes, will you please conclude?

DR. RAFIQ ZAKARIA: You allowed me but you interrupted me, perhaps justifiably. Thereafter you have allowed him twice the time. You don't interrupt him; that is my complaint.

MR. CHAIRMAN: Dr. Zakaria, I am accustomed to being more just than you.

DR. RAFIQ ZAKARIA: I have no comments to make on that, Sir.

DR. BHAI MAHAVIR: I have put a question specifically about the development of silicon and whether there was a better way of utilising the science talent available in the country.

SHRI VIJAY N. PATIL: Mr. Chairman, Sir,....

(*Interruptions*)

SHRI G. C. BHATTACHARYA: Many scientists committed suicide. He is only on the roads.

SHRI VIJAY N. PATIL: Sir, as the hon. Member knows, silicon is the basic material in the semi-conductor area. This question relates to manufacture of silicon. It has been developed but the economics of it are being worked out. Secondly, there is a committee for timely review of the progress in the various laboratories. And the hint which the hon. Member wants...

DR. BHAI MAHAVIR: No, no. The public sector....

(*Interruptions*)

MR. CHAIRMAN: Please don't interrupt. When you ask a ten-minute question, he will take at least three minutes.

SHRI VIJAY N. PATIL: Some private parties are also conducting. For example, Jyoti of Baroda are developing cold storage. Whenever R and D activities are there, there are various means of giving them help and that is being looked into.

MR. CHAIRMAN: About individual effort....

SHRI VIJAY N. PATIL: About crystals, they are successfully placed for giving energy to our Rohini satellite.

MR. CHAIRMAN: That is an individual item.

SHRIMATI INDIRA GANDHI: Sir, this is a sweeping statement against our scientists and against our research and development programmes. There are sometimes slippages—there is no doubt about it—as there are in every country, but basically what we have achieved is significant and I do not think it is at all right to denigrate our scientists in this manner.

DR. BHAI MAHAVIR: Sir, the Prime Minister has given a sweeping general reply. (*Interruptions*)

SHRI PILOO MODY: This reply calls for a rebuttal, Sir.

(*Interruptions*)

MR. CHAIRMAN: Dr. Bhai Mahavir, please sit down now.

(*Interruptions*)

DR. BHAI MAHAVIR: I asked a question—and the Prime Minister has not referred to the question—whether silion was claimed to have been successfully developed in the country.

MR. CHAIRMAN: Dr. Bhai Mahavir.... (*Interuptions*).

DR. BHAI MAHAVIR: The Prime Minister has given a sweeping defence of even wrong things. Silicon was claimed as having been developed by four laboratories and not even an ounce is produced. Let us inquire... (*Interruptions*).

MR. CHAIRMAN: Yes, Mr. Pant.

SHRI KRISHNA CHANDRA PANT: Sir, solar science has many applications: solar drying, air heating, water heating, cooking, refrigeration, pumping and power generation by the direct or indirect method. The question is: Does the Government, in its planned approach to the utilisation of solar energy, have any order of priority in respect of its various uses? For instance, pumping and drying may have priority in the rural areas Does the Government have any order of priority in accordance with which it is proceeding in its various schemes? That is number one. Number two is, whether it has made sure that after research the development aspect is paid sufficient attention so that processes which are developed can be quickly commercialised? Then there are large numbers of Indian scientists or scientists of Indian origin working abroad in the areas of application of solar energy. Many of them are prepared to come back provided the Government creates conditions in which they can work here. Would the Government consider making full use of such scientists in case they wish to come back?

SHRIMATI INDIRA GANDHI: Sir, we have set up a National Steering Committee to be convened by the DST including representatives of that Department Electronics, ICAR, Works and Housing, Health and Rural Reconstruction—from the water supply angle—to oversee and direct field trials of the photo-voltaic pump sets for rural application. We have also stressed the need for the manufacture of solar pumps and suggested that after completion of these demonstration trials, steps should be taken immediately to encourage the manufacture of these pumps on a substantial scale by domestic industry. And we certainly

welcome people coming from abroad or anywhere who can help the Indian science in any way, and especially, of course, if they are Indians

MR. CHAIRMAN: I think I will pass on to the next question.

Utilisation of installed capacity

*122. SHRI K. L. N. PRASAD: Will the Minister of INDUSTRY be pleased to state:

(a) whether it is a fact that the industrial growth could go up by 10 per cent if there is optimum utilisation of the installed capacity by each industry;

(b) if so, what steps Government propose to take so that all industries utilise their full capacity in future;

(c) whether Government have taken a decision to modernise industries by importing latest technology in order to reduce the production cost and improve the quality of goods; and

(d) what are the countries wherefrom the latest technology is being imported and what are the industries that are being modernised?

THE MINISTER OF STATE IN THE MINISTRY OF INDUSTRY (SHRI CHARANJIT CHANANA): (a) to (d). A statement is laid on the Table of the House.

Statement

(a) Yes, Sir. It may be possible to achieve a 10 per cent rate of growth in 1980-81 by utilising existing installed capacity.

(b) To revive the industrial infrastructure, a Cabinet Committee on Industrial Infrastructure has been set up which regularly reviews the generation of power, adequate movement of coal to thermal power plants, steel plants, cement plants, and increased movement of railway wagons. Some of the other important steps taken to optimise the capacity utilisation are import of certain critical inputs/raw materials. Such as non-ferros metals, edible oils, basic chemicals, etc., and improving labour-management relations.

The additional steps which Government proposes to take are: (i) In those industries which are important from the point of view of the national economy or are engaged in production of articles of mass consumption and where the licensed capacity does not reflect the full productive potential of the unit, appropriate additional capacities will be recognised by Government on a selective basis. (ii) Additional specified industries will be made eligible for automatic growth. (iii) the agencies connected with the issue of Letters of Intent/ Industrial Licences will also be made responsible for evolving a comprehensive system of monitoring the implementation of the schemes.

(c) Yes, Sir. The present policy relating to foreign collaboration permits imports of technology for modernisation and upgradation of technology.

(d) The main countries from which technology is being imported are: U.K., U.S.A., Japan, FRG, GDR, Italy, France, Switzerland and the Netherlands. The major industries which are being modernised through import of technology are: Industrial machinery, electrical equipment, transportation, metallurgical industries, machine tools, Misc. mech. and engineering, industries, chemicals (other than fertilizers), rubber goods, leather and leather goods, ceramics and glass.

SHRI K. L. N. PRASAD: Sir, the Minister, in his statement has said that it may be possible to achieve a growth rate of 10 per cent provided the existing installed capacity is put to full use. He said "may be"; that also means "it may not be". At the same time, he has also stated that the Government has taken steps to see that the power generation improves